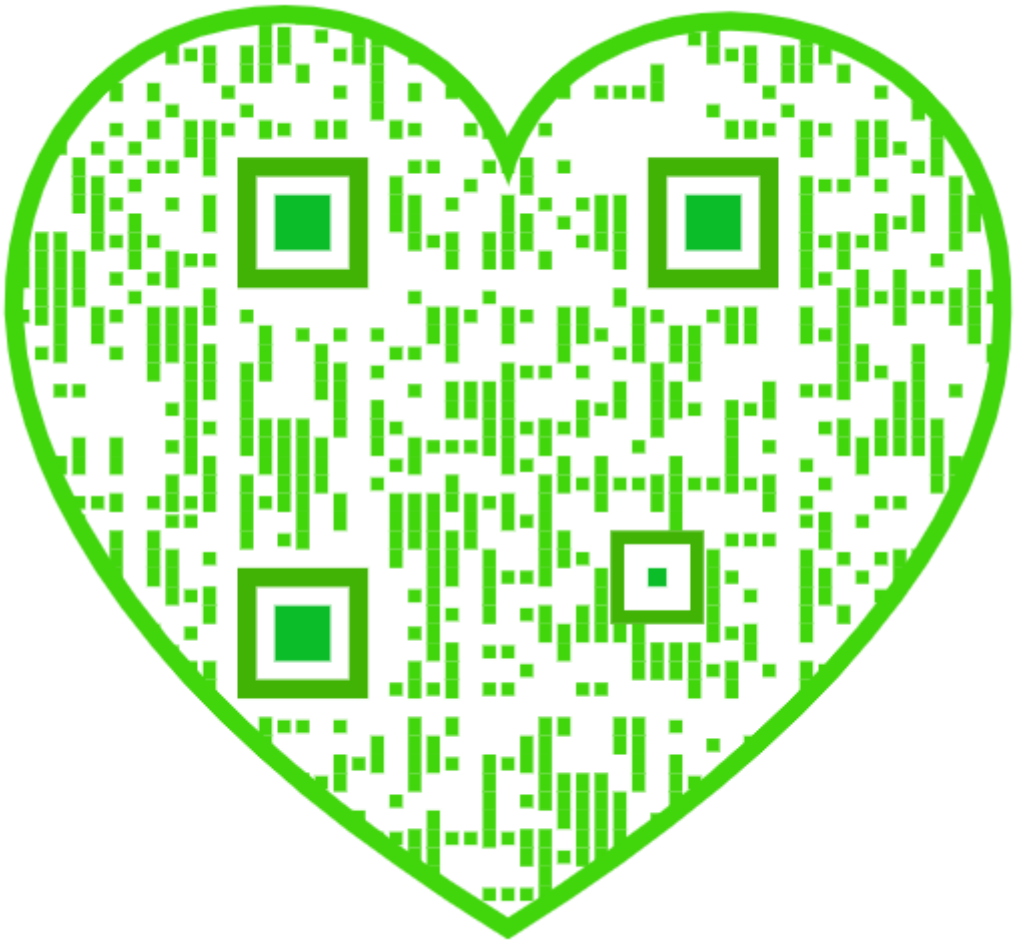
LXXXVI. *Obſervations for proving the Going of Mr.* Ellicott's *Clock, at* St. Helena; *by Mr.* Charles Maſon.

Read May 6, 1762. IN my return from the cape of Good Hope, the clock, uſed in the obſervations made there, was ſet going at James's fort, St. Helena, the pendulum remaining as at the Cape. Here I found myſelf at a great loſs, to get obſervations to prove its motion, the heavens being almoſt perpetually covered with clouds. At length, conſidering, that the place being ſituated in ſuch a narrow deep valley, if the times of the deſcent of the ſtars, over the weſtern ridge of rocks, (the altitude of whoſe neareſt ſummit was about 30°, and diſtant about a quarter of a mile, at the obſervatory) were obſerved, it would give the time per clock, in a ſidereal day; and the chances for ſuch obſervations would be greater, than by any other method, as they might be continued the whole night. Accordingly, I began to obſerve, by fixing the eye to a point: but this was ſoon improved, by the Reverend Mr. Maſkelyne, by making the ſtars deſcend each night, in the ſame part of the teleſcope of the equal altitude inſtrument: and it was very beautiful to ſee, how inſtantaneouſly they diſappeared.

The difference of the effect of gravity at the two places, on the going of the clock, may be ſeen, by comparing the following with the obſervations made at the Cape.

1761.



1761.	Time per clock.	Obſervations of the ſame letter to be compared together.	From the mean of the obſervations, the clock loſes of ſiderial time per day.	
Octob.	h ′ ″		″	
♄ 31.	21 48 58 —	Star - - *a*		Stars of the firſt, ſecond, or third magnitude, deſcended the hill, or rathe ridge of a keen extenſive rock, that forms one ſide of the valley.
	22 2 42 +	✱ - - *c*		
Nov.			57.0	
♃ 5.	21 44 12	Star - - *a*		
	21 57 57½	✱ - - *c*		
☿ 6.	22 10 34	✱ - - *e*		
	50 44 +	- - - *f*		
	54 8 +	- - - *g*		Per Mr. Maſkelyne.
	23 0 4½	- - - *h*		
	4 50	- - - *i*		
			57.3	
☉ 8.	22 8 26	✱ - - *e*		
	12 8	- - - *p*		
	48 49 +	- - - *f*		
	52 14 —	- - - *g*		
			57.3	
☽ 9.	22 11 10½	✱ - - *p*		Stars deſcended.
	47 52	- - - *f*		
	51 16 +	- - - *g*		
	57 12½	- - - *h*		
	23 1 57	- - - *i*		
			57.3	
♂ 10.	22 20 3 +	✱ - - *r*		
	46 55 —	- - - *f*		Per Mr. Maſkelyne.
	50 19	- - - *g*		
	56 14½	- - - *h*		
	23 1 0	- - - *i*		
			57.7	
☉ 15.	22 15 15 —	✱ - - *r*		
	42 6	- - - *f*		
	42 30 +	- - - *g*		
	56 11 —	- - - *i*		
			57.4	

1761.	Time per clock.		Observations of the same letter to be compared together.	From the mean of the observations, the clock loses of sidereal time per day.	
Nov.	h ′ ″			″	
☽ 16.	22 41 8	+	Star - - *f*		
	44 33	—	- - - *g*		
	50 29		- - - *h*		
	55 14	—	- - - *i*		
				57·5	
♃ 19.	22 41 40	+	* - - *g*		
	47 36½		- - - *h*		
	52 21½		- - - *i*		
Dec.					
♃ 3.	23 45 44		* - - *a*		} These are a set of different stars, the others descending in the daylight.
	50 44½		- - - *b*		
	51 10	—	- - - *c*		
	52 19		- - - *d*		
	53 42		- - - *e*		
				59·4	
♄ 5.	23 51 43	+	* - - *e*		
				59·1	
☉ 6.	23 42 47	—	* - - *a*		
	47 47		- - - *b*		
	48 12	+	- - - *c*		
	49 22		- - - *d*		
	50 44	+	- - - *e*		
☿ 9.	This day I discovered the wedges behind the clock, which was put to make it stand perpendicular, were loose; shrunk, I suppose, by the dryness of the place. Quære, If this was not the cause of the above difference.				
	The wedges being again secured,				
☉ 13.	0 17 5	:	* - - *g*		} These are different stars. Per Mr. Maskelyne.
	26 16		- - - *i*		
				58.5	
♂ 15.	0 15 7	:	* - - *g*		
	24 20		- - - *i*		
				59.0	

1761.	Time per clock.	Obſervations of the ſame letter to be compared together.	From the mean of the obſervations, the clock loſes of ſiderial time per day.	
Dec.	h ′ ″		″	
☿ 16.	0 21 47 —:	Star - - γ		
	23 21	- - - i		
	24 46	- - - k		
			58.85	Per Mr. Maſkelyne.
♃ 17.	0 20 47 +	✱ - - γ		
	22 22	- - - i		
	23 47 +	- - - k		
♄ 19.	0 49 31	✱ - - l		
	55 21 +	- - - m		
	1 2 56½	- - - n		
	1 9 14½	- - - o		
			58.4	
☉ 20.	0 48 33	✱ - - l		
	54 23 +	- - - m		
	1 1 58	- - - n		
	8 15½	- - - o		
			59.0	
♂ 22.	0 46 35 +	✱ - - l		
	52 25 —	- - - m		
	1 6 18 —	- - - o		

1762.
Jan.

♂ 5. The clock was ſtopped, and an arch put on, to ſhew the degrees and minutes the pendulum vibrates.

☿ 6. The apparent zenith diſtance of Aldebaran upon the meridian = 31° 55′ 20″.

♄ 9.	1 49 55	✱ - - p		
	52 31 +	Archarnar q		
	55 27 +	- - - r		
	2 8 28	- - - β		
	6 42 0	- - - -	- - -	The pendulum vibrates 2° 37′ on each ſide of the perpendicular.
			58.4	

1762.	Time per clock.			Observations of the same letter to be compared together.	From the mean of the observations, the clock loses of sidereal time per day.	
Jan.	h	′	″		″	
☉ 10.	1	48	56	Star - - *p*		
		51	32½	Archarnar *q*		
		54	29½	- - - *r*		
	2	7	30	- - - *β*		
	5	18	0	- - - -		Vibration 2 34 0
☽ 11.	4	56	0	- - - -		Ditto - 2 34 0
♂ 12.	14	47	0	- - - -		Ditto - 2 55 0
	2	45	53	- - - *δ*		Per Mr. Maskelyne.
					59.0	
☿ 13.	16	20	0	- - - -		Vibration 2 54 0
	2	44	54	* - - *δ*		
	3	40	36 :	- - - *u*		
		44	42 +	- - - *x*		
					59.1	
♃ 14.	16	39	0	- - - -		Ditto - 2 59 0
	3	39	37	* - - *μ*		
		43	43	- - - *z*		
		51	35 +	- - - *y*		
	4	23	47	- - - *a*		
♀ 15.	16	11	0	- - - -		Ditto - 2 58 0
					58.6	
♄ 16.	3	9	5 —	* - - *s*		
		16	33 —	- - - *t*		
		37	40 +	- - - *u*		Per Mr. Maskelyne.
		41	46 +	- - - *x*		
		49	38	- - - *y*		
	4	21	50	- - - *a*		
☉ 17.	15	38	0	- - - -		Vibration 2 53 0
☽ 18.	1	57	0	- - - -		Ditto - 2 55 0
					58.9	

1762.	Time per clock.	Obſervations of the ſame letter to be compared together.	From the mean of the obſervations, the clock loſes of ſiderial time per day.	
Jan.	h ′ ″		″	
♂ 19.	1 59 0	- - - -		Vibration 2 58 0
☿ 20.	3 2 0	- - - -		Ditto - 3 4 0
♃ 21.	2 36 5	Star - - ✶		
	3 4 10	- - - ſ		
	11 38½ :	- - - t		
	32 46	- - - u		
	4 1 14	- - - w		
	4 40 0	- - - -		Ditto - 3 2 0
			59.0	
♀ 22.	2 35 6 +	* - - ✶		
	3 3 11 —	- - - ſ		
	10 39½	- - - t		
	31 47 +	- - - u		
	4 0 15	- - - w		
	15 57 —	- - - a		
	4 50 0	- - - -		Ditto - 3 3 0

♄ 23. The clock taken down, and the pendulum ſecured, as at the cape of Good Hope, after the direction given per Mr. Ellicott the maker.

From the mean of a great number of obſervations, taken at different times of the day and night, Farenheit's thermometer ſtood at - - - - } in { November 68.7, December 70.3, January 72.3 } from 12th to the 18th.

The thermometer was hung by the ſide of the clock, and I never ſaw it higher (from 12th of November 1761 to January 18th, 1762) than 74½, or lower than 67.

Thoſe obſervations marked : are a little dubious.

Charles Maſon.